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Claims

- 1        1. An electronic key system which provides services
- 2        with the use of an electronic key, said system comprising:
- 3              a user module which has stored electronic key data
- 4        having a main ID and a sub ID to identify an electronic key,
- 5        and a service providing device which judges allowance or
- 6        denial of provision of services,
- 7        wherein:
  - 8              said user module comprises
  - 9              accepting means which accepts an electronic key
  - 10       transmission request from said service providing device,
  - 11       and
  - 12              transmitting means which transmits said electronic key
  - 13       data to said service providing device;
  - 14       said service providing device comprises
  - 15              storing means which stores service allowance
  - 16       information to allow the provision of services and service
  - 17       denial information to deny the provision of services,
  - 18              accepting means which accepts said electronic key data
  - 19       from said user module,
  - 20              first judging means which judges whether the main ID
  - 21       in said accepted electronic key data is present in said service
  - 22       allowance information,
  - 23              second judging means which judges whether the sub ID
  - 24       in said accepted electronic key data is present in said service

25 denial information, and  
26 provision judging means which judges allowance or  
27 denial of the provision of services according to results  
28 of said first and second judgments.

1       2. The electronic key system according to Claim 1,  
2 wherein:

3       said provision judging means allows the provision of  
4 services when said first judging means judges that the main  
5 ID is present in said service allowance table and said second  
6 judging means judges that the sub ID is absent in said service  
7 denial table.

1       3. The electronic key system according to Claim 1,  
2 wherein:

3       said electronic key data comprises shared hierarchy  
4 data indicating whether the electronic key can be shared  
5 or not; and

6       said user module further comprises generating means  
7 which generates an electronic key to be shared, having a  
8 same main ID and a different sub ID, when the shared hierarchy  
9 data indicates that the electronic key can be shared.

1       4. The electronic key system according to Claim 1,  
2 further comprising:

3       an electronic key managing apparatus which manages an

4 electronic key service,

5 wherein:

6 said electronic key managing apparatus comprises

7 a means which stores a client table containing a

8 membership number and a sub ID to identify a user,

9 accepting means which accepts the membership number

10 and the sub ID from an external system,

11 invalidation judging means which judges whether the

12 sub ID in said client table corresponding to the accepted

13 membership number matches with the accepted sub ID and judges,

14 according to a result of said judgment, whether entire

15 invalidation processing for invalidating all user modules

16 having a same main ID or partial invalidation processing

17 for invalidating only a user module having a same sub ID

18 is to be performed, and

19 transmitting means which transmits a result of said

20 invalidation judgment to said service providing device; and

21 said service providing device further comprises

22 changing means which changes said service denial table or

23 said service allowance table according to the result of said

24 invalidation judgment.

1 5. A user module which has stored electronic key data

2 used in judging allowance or denial of provision of services

3 by a service providing device which provides services,

4 wherein:

5        said electronic key data comprises main ID data and  
6    sub ID data to identify an electronic key; and  
7        said user module comprises transmission request  
8    accepting means which accepts an electronic key transmission  
9    request from said service providing device, and transmitting  
10   means which transmits said electronic key data to said service  
11   providing device.

1            6. The user module according to Claim 5,  
2    wherein said electronic key data is shared hierarchy data  
3    indicating whether the electronic key can be shared or not,  
4    and

5        wherein said user module further comprises:  
6        sharing request accepting means which accepts an  
7    electronic key sharing request;  
8        generating means which generates electronic key data  
9    to be shared, having a same main ID and a different sub ID,  
10   when the electronic key can be shared; and  
11        transmitting means which transmits said generated  
12   electronic key data to be shared to an external system.

1            7. The user module according to Claim 6, further  
2    comprising:

3        sharing judging means which judges that the electronic  
4    key cannot be shared when the shared hierarchy data has a  
5    specific value and the electronic key can be shared when

6 the shared hierarchy data has a value other than said specific  
7 value,

8 wherein said generating means generates said  
9 electronic key data to be shared by changing the value of  
10 the shared hierarchy data in said electronic key data by  
11 subtracting "1" therefrom.

1       8. A service providing device which judges allowance  
2 or denial of provision of services with the use of electronic  
3 key data stored in a user module, said device comprising:

4       storing means which stores service allowance  
5 information to allow the provision of services, and service  
6 denial information to deny the provision of services;

7       accepting means which accepts said electronic key data  
8 from said user module; and

9       judging means which judges allowance or denial of the  
10 provision of service for said accepted electronic key data  
11 on the basis of said accepted electronic key data, said service  
12 allowance information, and said service denial information.

1       9. The service providing device according to Claim 8,  
2 wherein:

3       said electronic key data comprises main ID data and  
4 sub ID data to identify an electronic key; and

5       said judging means comprises first judging means which  
6 judges whether a main ID in said accepted electronic key

7    data is present in said service allowance information, and  
8    second judging means which judges whether a sub ID in said  
9    accepted electronic key data is present in said service denial  
10   information, and judges allowance or denial of the provision  
11   of services for said accepted electronic key data according  
12   to results of said first and second judgments.

1                10. A service providing device which judges allowance  
2    or denial of provision of services with the use of electronic  
3    key data stored in a user module,  
4    wherein:

5                said electronic key data comprises main ID data and  
6    sub ID data to identify an electronic key;

7                said service providing device comprises storing means  
8    which stores service allowance information to allow the  
9    provision of services and service denial information to deny  
10   the provision of services;

11                invalidation accepting means which accepts a command  
12   for partial invalidation or a command for entire invalidation  
13   of the electronic key from said user module;

14                appending means which appends, when the command for  
15   the partial invalidation is accepted, main ID data and sub  
16   ID data contained in said command to said service denial  
17   information; and

18                deleting means which deletes, when the command for the  
19   entire invalidation is accepted, main ID data contained in

20. said command from said service allowance information.

1           11. An electronic key managing apparatus which manages  
2   electronic key data to receive provision of services, said  
3   apparatus comprising:

4           storing means which stores electronic key data having  
5   main ID data to identify an electronic key, sub ID data to  
6   identify the electronic key, and shared hierarchy data  
7   indicating a range within which the electronic key can be  
8   shared;

9           sharing requesting means which accepts a sharing  
10   request of the electronic key containing the sub ID data  
11   inputted from a linked-terminal apparatus via a network;

12          sharing judging means which judges whether the  
13   electronic key can be shared or not with reference to the  
14   shared hierarchy data; and

15          generating means which generates electronic key data  
16   to be shared when the electronic key can be shared.

1           12. An electronic key managing apparatus which manages  
2   electronic key data to receive provision of services, said  
3   apparatus comprising:

4           storing means which stores service allowance  
5   information to allow the provision of services and service  
6   denial information to deny the provision of services;

7          accepting means which accepts electronic key data from

8       an external system; and

9               judging means which judges allowance or denial of the  
10 provision of services for said accepted electronic key data  
11 on the basis of said accepted electronic key data, said service  
12 allowance information, and said service denial information.

1               13. A door locking/unlocking system which locks or  
2 unlocks a door of a residence with the use of an electronic  
3 key, said system comprising:

4               an IC card which has stored electronic key data having  
5 a main ID and a sub ID to identify an electronic key, and  
6 a device which locks or unlocks the door by judging validity  
7 of said electronic key data,

8               Wherein:

9               said IC card comprises transmitting means which accepts  
10 an electronic key transmission request from said device and  
11 transmits said electronic key data to said device; and  
12               said device comprises

13               storing means which stores service allowance  
14 information to allow the provision of services and service  
15 denial information to deny the provision of services,  
16 accepting means which accepts said electronic key data  
17 from said IC card,

18               first judging means which judges whether the main ID  
19 in said accepted electronic key data is present in said service  
20 allowance information,

21        second judging means which judges whether the sub ID  
22    in said accepted electronic key data is present in said service  
23    denial information, and  
24        performing means which locks or unlocks the door by  
25    judging the validity of said accepted electronic key data  
26   according to results of said first and second judgments.

1            14. A rental car service system which provides a key  
2    of a rental car to a user with the use of an electronic key  
3    as the key of the rental car, said system comprising:  
4        an IC card which has stored electronic key data having  
5    a main ID and a sub ID to identify the electronic key, a  
6    device which allows the use of the rental car by judging  
7    validity of said electronic key data, and an electronic key  
8    managing apparatus which manages said electronic key data  
9    to receive the provision of services,  
10   wherein:  
11        said electronic key managing apparatus comprises  
12   generating means which generates an electronic key having  
13   a main ID and a sub ID to identify a rental car selected  
14   from an external system, transmitting means which transmits  
15   said generated electronic key to the IC card of the user,  
16   and transmitting means which transmits said main ID to said  
17   device;  
18        said IC card comprises storing means which stores said  
19   generated electronic key; and

20        said device comprises storing means which stores said  
21   transmitted main ID into service allowance information to  
22   allow the provision of services.

1           15. A program of a computer apparatus used for a service  
2   providing device which judges allowance or denial of  
3   provision of services to judge allowance or denial of the  
4   provision of services, said program causing said computer  
5   apparatus to activate:

6           storing means which stores main ID data and sub ID data  
7   to identify an electronic key; and

8           transmission request accepting means which accepts an  
9   electronic key transmission request from said service  
10   providing device, and transmitting means which transmits  
11   said electronic key data to said service providing device.

1           16. The program according to Claim 15, further causing  
2   said computer apparatus to activate:

3           storing means which stores shared hierarchy data  
4   indicating whether the electronic key can be shared;

5           sharing request accepting means which accepts an  
6   electronic key sharing request;

7           generating means which generates electronic key data  
8   to be shared, having a same main ID and a different sub ID,  
9   when the electronic key can be shared; and

10          transmitting means which transmits said generated

11 electronic key data to be sharcd to an external system.

1        17. A program readable by a computer apparatus for  
2 judging allowance or denial of provision of services which  
3 causes the computer apparatus to judge allowance or denial  
4 of the provision of services with the use of electronic key  
5 data stored in a user module, said program causing said  
6 computer apparatus to activate:

7        storing means which stores service allowance  
8 information to allow the provision of services and service  
9 denial information to deny the provision of services;

10        accepting means which accepts said electronic key data  
11 from said user module; and

12        judging means which judges allowance or denial of the  
13 provision of services for said accepted electronic key data  
14 on the basis of said accepted electronic key data, said service  
15 allowance information, and said service denial information.

1        18. An electronic key usage method which provides  
2 services with the use of an electronic key, said method  
3 comprising:

4        a storing step of storing service allowance information  
5 to allow the provision of services and service denial  
6 information to deny the provision of services;

7        an accepting step of accepting electronic key data,  
8 containing main ID data and sub ID data to identify an

9 electronic key, from an external system;

10 a first judging step of judging whether a main ID of

11 said accepted electronic key data is present in said service

12 allowance information;

13 a second judging step of judging whether a sub ID of

14 said accepted electronic key data is present in said service

15 denial information; and

16 a provision allowance/denial judging step of judging

17 allowance or denial of the provision of services for said

18 accepted electronic key data according to results of said

19 first and second judging steps.